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PROBLEMS.

44. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.

A , B , and C together bought a ship. A paid for the a/b th, $=\frac{2}{3}$ th, part of the ship. B paid for the m/n th, $=\frac{3}{8}$ th, part of the ship. C paid \$ M , $=\$2000$. How many dollars did A and B , pay?

45. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.

In running a mile, A can give B $a=20$ yards; B can give C $b=88$ yards. How many yards can A give C ?

ALGEBRA.

Conducted by J. M. COLAW, Monterey, Va. All contributions to this department should be sent to him.

SOLUTIONS OF PROBLEMS.

34. Proposed by ROBERT J. ALEY, A. M., Professor of Mathematics, Indiana University, Bloomington, Indiana.

$$\sum_1^n \frac{(n+2)^2}{n(n+4)} = \text{what?}$$

Solution by J. F. W. SCHEFFER, A. M., Hagerstown, Maryland.

$$\sum_1^n \frac{(n+2)^2}{n(n+4)} = \sum_1^n \left[1 + \frac{4}{n(n+4)} \right] = \sum_1^n (1) + 4 \sum_1^n \frac{1}{n(n+4)} = n + 4 \sum_1^n \frac{1}{n(n+4)}.$$

$$\begin{aligned} \text{But } 4 \sum_1^n \frac{1}{n(n+4)} &= \left(\frac{1}{1} - \frac{1}{5} \right) + \left(\frac{1}{2} - \frac{1}{6} \right) + \left(\frac{1}{3} - \frac{1}{7} \right) + \left(\frac{1}{4} - \frac{1}{8} \right) + \dots \\ &+ \left(\frac{1}{n-4} - \frac{1}{n} \right) + \left(\frac{1}{n-3} - \frac{1}{n+1} \right) + \left(\frac{1}{n-2} - \frac{1}{n+2} \right) \\ &+ \left(\frac{1}{n-1} - \frac{1}{n+3} \right) + \left(\frac{1}{n} - \frac{1}{n+4} \right) = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} - \frac{1}{n+1} - \frac{1}{n+2} \\ &- \frac{1}{n+3} - \frac{1}{n+4} = \left(1 - \frac{1}{n+1} \right) + \left(\frac{1}{2} - \frac{1}{n+2} \right) + \left(\frac{1}{3} - \frac{1}{n+3} \right) + \left(\frac{1}{4} - \frac{1}{n+4} \right) \\ &= \frac{n}{n+1} + \frac{n}{2(n+2)} + \frac{n}{3(n+3)} + \frac{n}{4(n+4)}. \end{aligned}$$